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# The Tech.

VOL. III.

BOSTON, MAY 21, 1884.

No. 16.

## THE TECH.

Published on alternate Wednesdays, during the school year, by the students of the Massachusetts Institute of Technology.

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N bidding the class of '84 farewell, memories keep thronging before us of the many pleasant relations between '84 and '85, as classes, and between the individuals of each.

There is always a strong wish among the Juniors that they too were Seniors and were going out to make their fortunes; a wish which invariably comes back as a mockery when the good times—comparatively speaking—of school days are past.

Many of the friendships formed here will, we have no doubt, last through life. Many now good friends will be parted and meet one another years from now almost strangers, so different their lives, interests, thoughts, and associations.

Our Alma Mater does not pamper us; there is little sentimentality or romance about the life here, but she throws her sons forth to the

world fitted for rugged work. We wish the members of '84 success, one and all.

“Farewell! a word that must be, and hath been,—  
A sound which makes us linger;—yet—farewell.”

THE editor wishes to express his appreciation of the very efficient co-operation of the assistant editors during the past term. Also of Mr. Litchfield's services, and those of the many contributors who have helped to make THE TECH a success. The task, although involving extra work to a considerable extent, has been a pleasant one, and if, as we hope, the paper has accomplished some good, filled some want, the knowledge of this will amply repay the exertion it has cost.

AN editorial in No. 11 of THE TECH upon the age requirement for admission has provoked several replies and more or less discussion. We take this occasion, at the risk of making the subject wearisome, to explain some of our views as then stated, and to answer some of the objections, or to remove some of the misconceptions which have since appeared.

With regard to the communications of A. B., while cheerfully conceding the need of more or less advance of standard in other directions, we unhesitatingly affirm that no examinations are a complete test of an applicant's fitness, that an age requirement, however arbitrary, is an approximately fair, supplementary test, that it is eminently just to say that because a man is more mature at eighteen than at sixteen, men of eighteen are as a rule more mature than those of sixteen.

A. B.'s other argument, the loss of a year's time, seems plausible, but we cannot afford thus to overlook certain other possible, almost probable, contingencies. The assumption is that a man reaching his prime at fifty loses by begin-

ning a year or two later. To say that he is *equally* fitted is simply to evade the point at issue. Either of the following suppositions seems to us reasonably possible: first, ill-health, caused by over-exertion in school, may permanently reduce his working power, or determine its decline at forty-five instead of fifty; or, second, if the body were equal to the strain, lack of comprehension of the preparatory work, due to mental immaturity, might equally impair subsequent productive power; how much more the hasty and mistaken choice of a life work, which only long and bitter experience would atone for, though not remedy.

H. H. C., in No. 13, seems to have strangely misapprehended our original proposition. The remedy we proposed was not an extension of the course. In many of his suggestions we cordially concur; but we preferred, for lack of time and space, not to consider any changes in other requirements, believing that the age qualification, to a certain extent, admits, nay, even demands, consideration by itself.

The criticism of "A Senior," though perhaps more just, seems to us rather extravagant. We laid little stress on our suggestion of travel or business. We deemed it the less eligible alternative proposed. But we reaffirm, with confidence, our faith in the educative capabilities of the former course for many, if not for every youth. Of course the young man of sixteen summers requires guidance and oversight here as in almost every other pursuit. With such assistance, the beneficial effects would surely be large. We admit certain obvious disadvantages of the plan, but claim, on the other hand, that its benefits are not less real because they are somewhat intangible to the utilitarian American critic, and, indeed, cannot be measured by a written or oral examination. It seems to us at least possible that one who sees nothing "more foolish for the average boy of sixteen" may ascribe his difficulty, partially at least, to weakness of mental vision.

In conclusion we will add a few words to our own views as already expressed. We believe most thoroughly that various advances in our

standards are necessary in the near future, and we are even more fully convinced than before that the advantages of a simultaneous, though proportionately greater, advance in the age requirement would outweigh its evils. With this latter advance might diminish, or cease, the constant plea for relief from overwork, which seems to the writer unfounded and worthy of little consideration. With the two years left vacant in the life of the youth so rarely fortunate as to be fully qualified, mentally and physically, for entrance to the Institute at sixteen, he might most profitably lay a broad basis for his technical education by taking a liberal college course.

This, we may add, seems to us the best substitute here available for the German gymnasium and university system, and we have not cared to discuss what might be only ideally desirable. We believe that only good can come from careful, candid discussion, and our object will be attained if we have aroused interest in the question.

THE TECH printed some time ago the results of a canvass showing how '86 had spent its first vacation and stating that of seventy individuals questioned forty-seven had been at work part or all of the time, the majority of these in occupations in some way connected with their professional studies. This plan of utilizing the summer in the direction of our future work might be adopted with advantage by nearly all; of course we do not wish or expect to be idle four months, and work of this kind answers the double purpose of resting us from school labor and affording opportunities for gaining a great deal of practical experience. References, good-natured or severe, are frequently made in newspapers and elsewhere to "fledgling graduates," who are sometimes too willing to oppose their judgment to that of older men with years of experience, not realizing to what extent theory must be modified in practice and how much care must be exercised in applying abstract principles to common affairs. Our work in the laboratories and shops may, besides laying the foundations for our stock of wisdom, make us more

careful in expressing opinions and be the means of sparing us from much reference to our lack of feathers; not because it furnishes us with a complete working outfit of experience,—that comes only with time, whereas the laboratory instruction is necessarily limited in amount and variety,—but because it helps us to a realization of the fact that at graduation our professional knowledge is more or less superficial and can be made thorough only by years of careful study, during our professional career, upon those restricted branches to which, in this age of specialists, we shall probably be obliged to devote ourselves. During the coming vacation many of us will be able, if we seek for opportunities, to find employment in mines, factories, or machine shops, or in drafting or surveying; and by thus supplementing our laboratory practice and associating with those whose lives are spent in these pursuits we shall acquire a familiarity with our subject which will in future be of great value.

#### Memories.

Ghosts are abroad to-night —  
A strange and chilly crew;  
Ghosts of the knights of old  
And the deeds we meant to do,  
When life was a long, bright dream,  
And only dreams were true.

#### A Sunrise on Mt. Washington.

AT last we have decided upon a day to go up Mt. Washington. We scan the heavens, on the afternoon previous, to see if the omens bid fair. When the hours follow each other in quick succession, showing a clear sky and shining sun, we fairly shout for joy. But, alas for all our hopes about five o'clock a heavy thunder-cap looms up from the northwest. All is dark and dismal. The rain pours down in torrents, the heavy air weighs upon our spirits, and under its pressure we sink as does the ripened wheat in a storm of wind and rain. Look, what is it we see now? There is a break among the clouds, the break becomes an opening, the opening enough to make a pair of sailor's pants. We quickly put old Kate and the buckboard into service on the roads, and soon reach the

summit of the hill behind the house, where we behold the glorious sun sink into his couch of varying hues. Then, as you may easily imagine, we gladly return and betake ourselves to our own couches, to be ready for an early start.

Ding, dong; ding, dong; there goes the bell for rising. Up we jump, quickly dress, and eat our breakfast, and take our places for the ride to Bethlehem, where we enter the train for the Base Station. Here we have hardly time to examine the little dumpy cars, with their seats tipped forward so as to make them horizontal in ascending the mountain, before the cars move upward, each with its own engine. When I see one of these little engines pushing up its car in front of it, I can think of nothing but a man wheeling a heavily loaded barrow up a hill. Each engine as it puffs along seems to groan under its load of people which it forces resolutely up the steep mountain-side. But while I am so absorbed in the process of ascent, the ascent itself is completed, and we step from our car to the platform, which is, as well, the piazza of the Summit House. Here we stand completely enveloped in clouds. The wind drives the clouds with great rapidity past us, and putting out our hand as a child to snatch a fleecy speck, lo! it is gone, and another holds its place.

Several times during the forenoon an opening through the clouds is made, and we see fair vistas of land encircled by a leaden frame. Thus many beautiful little pictures are shown, giving us time, however, between the views to fix the last one firmly on our minds.

Soon after dinner, the train pitches off the platform into a sea of cloud, carrying many souls disappointed at having seen so little, and leaving behind them those of us who are vacillating between hope and fear,—hope of its clearing away, fear that we shall see no more of Mother Earth beneath us.

Dressed in our winter clothes, we seat ourselves around the great red fire, and toast ourselves quite brown. Then buttoning our overcoats up to the chin, we sally forth into the cold air. We visit the old Tip-Top House, now used for a printing office, and buy a copy of



"Among the Clouds," containing our names, and examine the curious old stone foundation of the building. From this place we go over to the Signal Station, where two men stay throughout the year, undergoing many hardships.

Toward sunset the clouds break away for a minute now and then, and we gain glimpses of the other peaks in the range, and once we see the sun himself shining through a hollow cylinder of vapor, appearing like a raging fire in the distance. About nine o'clock the moon dispels the clouds a little, giving us a few glimpses of moon-lit earth below. And looking off westward, we see the electric lights at the Maplewood, Bethlehem, about twenty miles distant. We now retire with the fond hope that the moon will scatter the clouds before morning dawns.

About an hour after midnight I am awakened by a bright light in the room. I jump up, thinking it must be day, but looking out, I am spell-bound with astonishment. The clouds, as if crouching in fear of the moon, have settled down over the land into a mid-air sea. The mountain peaks loom up in little islands here and there. The moon shines across the foamy surface, and sheds its glittering light upon this upper ocean. All is hushed in awful silence. The moon appears a nearer, brighter friend than ever before, and it seems that I could gaze forever on this delightful scene. But no, I must return to sleep to be prepared for the sunrise; and I wonder if that by any possibility can be more entrancing than this moonlight.

The faint light in the east has appeared, the dawning has begun to strengthen, the house is all astir holding its breath to witness the sunrise; so I dress and go out upon the dripping rocks, where soon all assemble with thickest garments to gaze off upon the brightening east. The same white sea stretches towards the eastern horizon as that of the night previous. The gently undulating plain of waves seems to be waiting motionless, like the spectators, for the sun's advent.

But on the western side the clouds have all departed, and valley and mountain, each in turn,

stretch on and on, till the eye can no more distinguish. We ascend the observatory; and from the watch-tower of New England, the highest lookout of the Pilgrim's rocky land, we survey first the east, with its increasing glory, then the west, with its lights and shades. Now the sky is illumined far into the zenith with rosy tints; each moment the shades are changing, until at last the sun surmounts the broad expanse and shines with great brightness across the level sea of cloud. We are exalted above the summit and seem to mount into the upper air.

We turn our eyes to the west, and behold a wonderful sight to the uninitiated, for we see the shadow of the very mountain on which we stand, approaching nearer and nearer.

Our time is almost over; we must eat our breakfast and be ready to take our train. It is hard to leave such beauty, but it is best to leave while the vision is still present, before clouds creep over the face of our ideal, and sadden our hearts.

The whistle sounds, we take our seats, and the faithful engine bears us down from this elevating spot, down to the plain of mortals. But, be our life shorter or longer, the pleasure of the trip and the never-fading picture of that sunrise on Mt. Washington will always be present to cheer a gloomy day.

I. O.

### The Chicago Fire Insurance Patrol.

[A paper read before the meeting of the Class of '85, Feb. 9, '84.]

IN October, 1871, about a week "before the fire," the agents of the fire-insurance companies doing business in Chicago organized a company of eight men, provided with two horses and a wagon, whose duty it was to run to fires, and while the city fire department was at work protect with suitable covers goods which, left exposed, might be badly damaged by smoke and water; in this way they hoped to lessen their enormous losses on goods not in the least burned, but ruined by being wet and smoked. The scheme succeeded so well that there are now three stations of this Fire Patrol in different parts of the city, supported entirely by assess-

ments upon the insurance companies, and consisting of over thirty men, equipped with wagons and horses, Babcock extinguishers, tools, and all other paraphernalia for their business; and its financial success is shown by the fact that sometimes at a single large fire the active work of the men prevents losses considerably greater in amount than the whole yearly cost of maintaining the patrol.

Of the three divisions, one is located in the central business part of the city, one in a secondary business quarter farther west, and the third at the Union Stock Yards, among the cattle-sheds and packing houses. Besides doing duty at fires, certain members of the patrol inspect buildings for gasoline, unsafe constructions or exposures, and other points of danger from fire, and every morning results of the inspection and reports of all fires which have occurred during the previous day, with their causes, amounts of damage, insurance companies represented, and any other items of interest, are printed and distributed to the insurance offices.

The company in the main business centre is the largest and most important; it occupies a two story and basement brick building, twenty-six by one hundred feet, on Monroe Street, near LaSalle, and it is interesting to note that nearly all work on the building and contents, except masonry, was done by members of the patrol, who are all good mechanics. The basement is occupied for storage of chemicals and other supplies, and contains stalls for two horses, — one an extra wagon-horse, and the other the saddle-horse of the superintendent, Capt. B. B. Bullwinkle. In the rear are a blacksmith's forge and a workshop, where wagons and various implements are manufactured or repaired.

On the first floor, just inside the large front door, stands the wagon, built by the men; it is handsome, strong, light, and runs with great ease; it is provided with two Babcock hand fire extinguishers, one hundred covers of twenty square feet surface each, made of heavy cloth saturated with chemicals for keeping off water, and axes, ladders, brooms, pikes, and other tools, and carries eight or ten men. It is drawn by

two powerful horses, whose stalls are on either side of the building, opposite the wagon-pole; the horses are kept harnessed, and at the first sound of an alarm spring to their places, when they are attached to the wagon by buckles snapped into place by men posted in suitable positions, — an operation which is performed so quickly that at the regular noon drill the time required to hitch is only one and a half or two seconds.

Near the wagon is the electric apparatus, by which the number of any box from which an alarm is sent in can be instantly read, and by means of which is established an automatic alarm system with the telephone and telegraph companies and some of the principal business houses; here are located also the electrical contrivances by which the machinery of the building, such as trap-doors and lighting apparatus, is worked; and in the midst of these instruments is the bunk where the superintendent sleeps. Back of the wagon are sleeping arrangements for three men, who do the hitching at night; also tools, shelves piled with extra covers, frames for drying wet covers, lockers for the men, etc.; there is also a wagon drawn by one horse, and supplied with covers and with bags of sawdust, which, thrown about in a building, absorbs vapor, and prevents much damage by moisture and subsequent moulding of such material as tobacco. This wagon follows the other on alarms after nine o'clock at night, when the large fires are liable to occur. Communication between the first floor and basement is by means of an inclined plane in the centre of the building, which can be swung up into the floor, forming a part of it, thus enabling the wagon to be drawn from the rear entrance forward to its usual position.

The second story is reached by a flight of stairs on each side of the building near the front, and by another above the inclined plane, and raised by the same mechanism to allow the wagon to pass under. On this floor, in front, is a handsomely furnished reception-room, which contains the superintendent's office and a register, wherein are inscribed the names of visitors to the patrol, — among them Gen. Grant and

other Presidents of the United States; President Diaz, Thomas Edison, Capt. Shaw, Rufus Hatch, and many others of various nations. The back room contains a library, piano, and billiard table, an aquarium, and books in which the records of fires are kept. Between these two rooms is a large bedroom.

Knowing now the general arrangement of the building, let us suppose it to be the patrol's bedtime, and watch the proceedings of the men until they are all asleep, and then see what happens on the sounding of an alarm in their district. Before going up-stairs for the night, each man sets at his place in the wagon his rubber boots, into which are tucked his coated-with-rubber-up-to-the-hips pantaloons; his rubber coat is also in the wagon, and his light fireman's hat of compressed paper hangs outside. Three men sleep down-stairs near the horses; the rest go up to the bedroom whose eight or ten single beds are soon clustered around two well concealed trap-doors in the floor directly over the wagon. At the foot of each bed, under the neat white spread, is coiled a rope, with one end fastened to the bedclothes; the other end is now attached to a hook suspended overhead; then lights are put out, the men crawl in, and before long silence reigns.

We are now ready for the alarm. Here it comes, and what a commotion follows! At the first stroke of the gong all the electric machinery is set in motion; the gas is lighted, the bedclothes, by the rope connections, are jerked into the air out of the way, the men roll out of bed, fall through the opened trap-doors and slide down troughs into their pants and boots in the wagon below; the front door has flown open and the harnessing been done by the three men who sleep beside the wagon, and whose bedclothes have also been jerked off by electricity; the driver catches the reins from the seat, the superintendent, roused from his bunk, shouts the number of the box, takes his place on the wagon, and with clanging bell and gong the patrol is off,—and some distance off by this time, for all that has been described takes place in from four to six seconds.

Upon reaching the fire, each man shoulders

an extinguisher or some covers and goes to work. Small fires are sometimes put out before the arrival of the city fire department; the covers are spread as rapidly as possible, five men being able to handle sixty of them in five minutes; and it will be seen that the men belonging to the patrol are obliged to work in the burning building, in hot, smoky, and even dangerous places, while the firemen can frequently throw streams from a safer and more comfortable distance. When the work of protecting goods is over, a man being left, perhaps, to guard the premises in the interests of the insurance companies, the rest return, the wagon is washed and its outfit replenished, wet covers are hung up to dry, and the men betake themselves to rest.

The apparatus of the other business district patrol company is similar to that just described, though of smaller proportions. The wagon of the Stock Yards Company is a chemical extinguisher, which is considered better than a steam fire engine for such a district, both on account of its lightness and its power of smothering burning grease. The buildings of the companies are models of convenience and good order, and their occupants are proud of the institution and its reputation, as they may well be; for the system of instruction and discipline is so excellent that various cities have sent representative firemen to Chicago to be drilled by Capt. Bullwinkle and his men.

T. W. F.

### Spirits.

THE room grew gradually darker and darker, the air denser and denser, till the stuffed white dove that hung from the chandelier could no longer be seen, and one's breath became labored. The music from the hostess and her colored servant died away into a faint and ever fainter dirge; the nervous rustle of the silk dress of the end lady was all that betokened the presence of anxious waiters for news from the spirit world — only the subdued buzzing of the curtained lantern in the corner, offered a fitting rhythmical accompaniment for the increasing obscurity of sensation. The curtain had long



been drawn before the black cabinet, big with mystery.

The woman who had lost her husband was expectant. Ah! if he would only come. So many times when he was with her daily had he spoken to her with a sad, sweet smile, as if he even then realized what a zest the pleasure would have for her if she should have communion with him when this corporal dross should have been purged away. The dear good man! How kind he always was! How softly he always spoke! Oh! would he come to-night?

Presently in the midst of the screechy rendering of "Sweet By and By," came a loud tap from the cabinet: —

"Hard to materialize to-night," came in deep gruff tones from behind the black drapery.

"Is that you, Billy?" asked landlady in dulcet tones.

"Yes 'm," was returned.

"What do you want to-night, Billy?" asked the hostess, in the same sweet accents. A long pause ensued. At last, —

"I could n't come right away; I was only partly materialized." Billy certainly had an undeniable Irish brogue. His voice was very deep, too. Presently, when he got more thoroughly materialized he came out into the room and condescended to lift a chair or two at arm's length at the special request of an inquisitive young man of the circle. Violet came out too, and though it was the dead of winter and a parlor carpet might have been thought the last place where violets would grow at any time, she succeeded in gathering quite a handful, — at least those who expected to do so could see them. Mrs. Vane favored the circle for a few minutes with her gracious presence, and conversed in lisping tones with some who had been her companions before she had taken her flight into the abode of the ethereal; at last she tore herself away, after bestowing a lingering parting kiss on him who had once been her husband — he had another wife now, who henpecked him, and he fled in despair to the spiritual companionship of his former spouse.

Others of the choice departed arrived from

time to time; but it was all by-play to Maria. The man who had just conversed with his wife had been telling her of the sweets of such communion, and she was growing distracted with nervous desire and yet fear, to see her husband in his spirituality. At last she mustered up courage to ask Billy, while he was in one of his good-natured moods, if her husband would not come that night.

"Yes 'm," returned Billy; "he's here already; but he can't materialize; it's too light or suthin."

"Too light, Billy?" protested the hostess. "Dr. Brown, would you be so kind as to shet that lantern a little more? Thanks. Shell we sing 'By the River,' Billy?" As no answer came, she nudged the colored accompanist, and the music began again.

A loud rap interrupted the singing.

"Do you want somebody?" asked the hostess, kindly.

Yes; somebody was wanted. So, beginning at the right of the front line, each one would have asked, "Is it I?" but the first man happened to say, "Is it me?" and the rest of the circle was too well-bred to correct him, and the question went the length of the line and half the row behind, till it came Maria's turn. With trembling voice she uttered the words, "Is it me?" Two loud distinct raps followed. She wiped her mouth in preparation.

A shadowy figure glided hesitatingly from the medium's cabinet. With a flutter Maria bounded forward to meet it.

"Is it you, Henry? Don't you recognize your Maria?" she whispered.

"Yes — Maria — yes — yes — be — a good girl — Maria — yes — yes — be a good — girl — yes" — The spirit's tones were soft and sweet, and died away into silence as his form disappeared into the cabinet. Then he ventured back again, and Maria kissed him; finally he departed.

Maria was overwhelmed. The sweet rush of joy in beholding him again had taken her breath away. "And to think" she said to the lady who sat next her, "to think he recognized me immediately!" Her cup of joy was full to overflow-

ing, with superstition. She drunk it to the dregs.

By and by Billy was on the rampage again. He was showing how easily he could raise a chair vertical, with one hand, and challenged the inquisitive young man to try his skill. The young man did it a little better than Billy himself; and Billy magnanimously shook hands with him. That hand-shake was a little too much; the light had to be turned on again to release the poor spirit.

When every one had become used to the brightness, however, the spirit had vanished into thin air; in some strange and unaccountable way, the medium had inserted her hands into the inquisitive young man's grasp.

It was well Maria had drunk her cupful all down, for if she had left any undrunk it would have been turned to gall. J. G. H.

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## Communications.

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### The Torchlight of 1884.

As this is the last number of THE TECH for the year, it seems to be a fit place to say a few words about the torchlight procession which occurs early next November. Probably many of the facts concerning the procession of the last torchlight are unknown to the majority of the present members of the Institute.

Each November preceding the Presidential election there are many torchlight processions, but all the interest centres in *the* great Republican torchlight procession just before the election takes place, which is the final effort of the campaign. It is usually several miles in length and includes companies from all parts of the State, and always includes a battalion from the Institute.

Last election THE TECH battalion comprised five companies, one from each class and one from the Mechanic Arts,—in all about 150 men; but next year this number ought to be greatly increased, owing to the larger number of men in the Institute, to at least 500 men, and instead of being *one* of the best battalions in the line it should be *the* "crack" battalion with no excep-

tion. The uniform adopted by the Institute at the last procession was an Oxford gown of gray cambric with crimson trimmings, and a crimson number of the class on the chest, a crimson mortar board with white tassel, and a red, white and blue swing torch, making a very striking and effective show.

The torchlight procession is the only amusement or recreation during the four years' course at the Institute in which all can take part at a very small cost, and as the term has just opened and the solid work hardly begun when it takes place, it does not interfere seriously with the studies of any one.

The drum corps is a feature in which we should excel, as we now have a very considerable number of fifiers in the Institute to add their dulcet tunes to those of the drums.

Of course each company has one or more transparencies,—wooden frames covered with cloth on which appropriate inscriptions are placed and lighted by candles inside,—carried on poles; and these are not the least fun of all, as no end of remarks are caused thereby among the crowd. '85.

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NOTICE.—As it is desired to make up as many full sets as possible of the catalogues of the Institute of Technology, any one having in his possession extra copies of the following numbers will confer a great favor by sending them to the Secretary, Prof. Webster Wells.

Nos. 1 (1865-6), 3 (1867-8), 5 (1869-70), 12 (1876-7), 13 (1877-8).

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The Board of Directors for THE TECH for 1884-85, is as follows:—

I. W. Litchfield, '85, President; W. H. Chadbourn, '86, Secretary; J. W. Adams, '87, Treasurer; A. R. McKim, '85; J. E. Simpson, '86.

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The Board has elected the following editors: T. W. Fry, '85, editor-in-chief; H. V. Hayes, '85; H. McRae, '85; J. G. Howard, '86; W. R. Ingalls, '86; B. C. Lane, '87; and F. M. Wakefield, '87.

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## Department Notes.

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During the summer, Room 34 in the new building will be fitted up as a laboratory of sanitary chemistry. The instruction in this branch of chemistry will be under the general oversight of Prof. Nichols, but in the immediate charge of Mrs. Richards. It cannot be said that the fitting up of this laboratory meets a very pressing need, because the analytical and organic laboratories have hitherto furnished all necessary accommodations. These laboratories will be relieved of certain lines of work by the change, and the new laboratory will afford opportunity for advanced students and for special students desiring to carry out investigations in this portion of the field of chemistry.

The laboratories of the mining department will be thoroughly reorganized before the opening of the fall term, the changes being already well advanced. The floor of the old third-year laboratory has been laid with pressed brick, and the furnaces have already been put in,—ten crucible furnaces and three double cupel furnaces. This will be the assaying-room of the future, and what with the desks which will be provided for the men, and the new apparatus to be bought, much better work in assaying may be expected than has ever been accomplished before. The metallurgical laboratory will also undergo some modification. The platform now surrounding the pit will be taken away, which will make the pit about twice as large as it is at present; and a new cupola furnace is to replace the one now standing in the pit, which gives evidence of the hard work it has been through in years past. A large vault seventy-two feet long by sixteen and a half feet wide, six and a half feet clear, is being dug on the east side of the building, which will be divided into bins for the coal and ores of the mining department.

Many other changes are prospected, the details of which are not yet ready for publication. One feature more may be mentioned, however, which will be of interest to the miners, and this is in regard to a slight change proposed in the matter of instruction. It is intended to adopt

the same plan now pursued in the chemical department of having papyrograph notes describing the apparatus in use, and their application to the processes in hand.

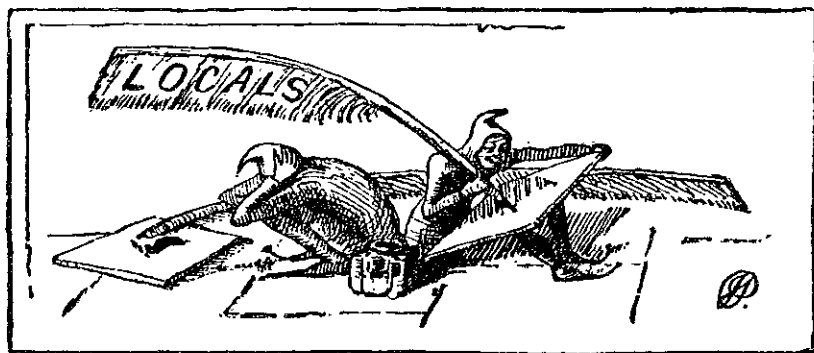
A committee of the Franklin Institute has been investigating the Shaw locomotive, and, though favoring the "duplex" principle of its construction,—a pair of cylinders on each side, the pistons of each pair moving simultaneously in opposite directions,—doubts its practicability on account of its complication. This fact and the doubtful success of compound locomotives here and in England indicate that there is no immediate prospect of a general change from two cylinder locomotives.

The imports of iron and steel at New York during April were 42,003 tons.

Messrs. P. Lorillard & Co. have opened at Jersey City a free library and reading-room for the benefit of their three hundred employes; about ten thousand volumes will be procured, and the subscription list will include one hundred papers and periodicals.

Those who desire a comparatively permanent investment will do well to buy bonds of the Pittsburg, Ft. Wayne & Chicago Railroad, which has proposed to issue a series due at the option of the company any time after the year 1868.

Owing to changes made last fall in the basement, work on the beam-testing machine was not begun until some time in November, consequently the number of experiments has been smaller than last year. During the year tests have been made on yellow pine and spruce beams, both concentrated and distributed load, and on yellow pine headers with floor joists framed into them. Later, experiment was tried to find out what effect the mortises had on strength of the header, and although not enough tests were made to get an average, yet in one case it was found that where a 6" x 12" header 5' 4" long, hung in iron stirrups, with three floor joists framed into it, bore but 10,000 lbs. before breaking across mortises, a header of same section, 6' 5" span, without mortises, centre load, could not be broken at 48,000 lbs.



Good by, eighty-four!

SUBSCRIBE FOR VOLUME IV.!

Hope you'll enjoy vacation. Going to be very busy on "conditions"?

It is rumored that the popular Mr. Bunce has been appointed assistant rector at the "chapel"

Several members of the Senior class have been invited to come back to the Institute next year as assistants.

Course VI., metallurgy, has been dropped from the list of courses, or rather, it has been changed to III C.

Mr. Burlingham, '86, was elected a member of the Boston Natural History Society at its last regular meeting.

There's one advantage in having an examination every day: you get them off your hands so much the sooner (*i. e.*, if you do).

Specimens of the work of the students in the weaving department have been sent to an exhibition of such goods in the West.

The second year miners availed themselves of Mr. Bartlett's kind offer, and were photographed by him last week on the back steps of the new building.

The weaving-room has finally received the new loom promised some time ago. It came from the factory of Knowles Bros., and is a very handsome machine.

Mr. Woodbury, '86, to whom THE TECH is indebted for several well drawn initials, had a picture in the recent exhibition of the Boston Art Club.

Examinations for entrance to the Institute will be held May 29 and 30, in Boston, Washington, Cincinnati, Chicago, St. Louis, and San Francisco.

The papyrograph notes on quantitative analysis, used in the analytical laboratory, are being revised, and are to be printed and published in pamphlet form. Papyrograph notes must go.

Invitations have been issued to all members of '84 to attend a social reunion of the Alumni of the Institute at Young's Hotel on Monday evening, May 26, the evening preceding Commencement.

The Commencement exercises will be held in Huntington Hall on the afternoon of the 27th inst., at three o'clock, and will consist in the presentation of degrees and the reading of abstracts of theses only. There will be no music.

At a recent meeting in the Y. M. C. A. gymnasium, a light-weight tug-of-war team, consisting of Winsor, Reynolds, Tuttle, and Shore, all of '86, defeated a team from the Association in a three minutes' pull.

The Sophomore classes in mechanism made their last excursion of the year to the machine shops of the Charlestown Navy Yard. All the students were much impressed with the massiveness of the tools and the excellent condition of the shops.

Mr. Howard V. Frost, '82, assistant in general chemistry at the Institute, has been promoted to instructor in general chemistry.

The regular exercises of the school were suspended on the 13th; the term is concluded on the 24th, and the degrees conferred on the members of the graduating class, the 27th. The next school year begins on Monday, Sept. 29.

It is evident that the Faculty recognizes the necessity of a knowledge of surveying in a miner's education. The miners' course in surveying formerly occupied only one half of the second year; with the current year it was extended so as to include both terms, whereby an adequate knowledge of levelling was acquired; and by the revised schedule we see that in addition it is to occupy one half of the third year. We cite this as one of the instances of the tendency of our Faculty to keep up with the times.

We are indebted to the class of '87 for one of the class photographs recently taken.

The Senior ball this year has proved a great success financially as well as socially. Not only is there no deficit, but the committee has a small surplus, which it has turned over to the next Senior ball committee.

The result of the competitive examination in Boston for the Rotch travelling scholarship was announced recently, one hundred and seventy-five being the standard. There were six candidates, and the highest rank, one hundred and fifty-six, was attained by Mr. Clarence H. Blackall, who was awarded the scholarship.

A majority of the Freshman class have replied to the circular from the registrar in regard to the choice of course, and the following is the result: civil engineering, 18; mechanical engineering, 41; mining engineering, 13; architecture, 8; chemistry, 8; medicine, 2; electrical engineering, 16; general courses, 3. These figures will be increased on the receipt of the remaining circulars, but are liable to change, as this choice is not final. An examination of the figures shows that the course in electricity gains nothing over last year, civil and mining engineering more than hold their own, while the great increase is in the direction of mechanical engineering.

The annual prize drill of the corps of cadets took place in Washington Hall of the Mechanics' Fair Building, on the tenth of the current month. The programme consisted of battalion drill, company drill for two flags presented by the Sophomore class, and an individual drill for medals. These were succeeded by dress parade, at which the prizes were awarded by President Walker, as follows: Company drill: first prize, Company B, Capt. Frank E. Shepard; second prize, Company A, Capt. Edward A. Haskell. Individual drill: first prize, Private C. B. Kendall, Company A; second prize, First Sergeant Walter Gleason. A special prize for those who had never drilled previous to this year was won by Private P. Bryant. The battalion was under the command of Major Locke, '86. Adjutant Underhill commanded the prize squad, and Quartermaster Barron acted as officer of the day.

Prof. Lanza gave a very pleasant reception to his fourth-year mechanics class at his house on the evening of May 2. Nearly all the members of the class were present, and, in addition, some of the professors and their wives. After a sumptuous collation singing was indulged in until a late hour. Prof. Lanza has had several of these social gatherings this year, which evince the very cordial relations which exist between professor and students.

Saturday afternoon, May 24, is the date fixed for the '85 harbor excursion, and as the examinations all close Saturday A. M., a large party is expected. A steam yacht has been chartered, which will leave India Wharf at 2 o'clock and return by early bedtime. Permits to land at the various points of interest have been secured, while the entertainment on board will be furnished by the '85 orchestra and a caterer.

At the last meeting of the *F. S. T.* the following officers were elected for 1884-85: President, A. R. McKim, '85; vice-president, Chas. F. Spring, '85; secretary, S. Williams, '85; treasurer, L. M. Thacher, '86; committee on eligibility, C. F. Spring, E. Worthington, Jr., and B. F. Goodnough. The annual supper will be held at the Quincy House, Thursday, May 22.

The Faculty have completed their work of the revision of the courses, and the changes are announced. They consist principally in classifying certain strictly professional subjects in each course, which all students of that course are required to take; in addition to these there are electives, between which the student may choose. The tendency of it all is to reduce the courses to a strictly professional basis, while more general subjects are left optional. While the changes do not make a course at the Institute by any means an easy one, still it relieves those courses where the pressure was formerly too great, and we trust we shall hear no more complaints of overwork. The course in mining has been most altered, and all the alterations have been for the better. It would be hard to improve upon the regular course with option I.

*Now is the time to subscribe.*

## List of Publications, M. I. T.

CLASS OF '74. Class Directory. Folded circular. 1884.

CLASS OF '79. Class Directory. List of Officers, etc. Pph., 16mo, pp. 15. 1884.

BARROWS, WALTER B. ('76). Birds of the Lower Uruguay. *The Auk*, I. (1884), 20. A series of papers begun in *Bull. Nuttall Ornith. Club*.

BARTON, GEO. H. ('80). Notes on the Lava Flow of 1880-81 from Mauna Loa. *Science*, III. (1884), 410-413.

BROOKS, FRED. (Certif. '70). Mexican Notes. *Four. Assoc. Eng. Societies*, II. (1883), 313-322.

CROSBY, W. O. ('76). The Colors of Natural Waters. *Science*, III. (1884), 445.

CROSS, CHARLES R. ('68). Report on Fire Alarm Signals presented to the Boston Tariff Association, Oct. 23, 1883. Pamphlet. — Report on Buell Automatic Alarm, Jan. 24, 1884. Pp. 2. — Report on Experiments with Brush Storage Battery. *Electrician* (London), Feb. 9, 1884. — Secondary Batteries. Review. *Science*, Jan. 11, 1884.

GREENE, CHAS. E. ('68). Green Mountain Railway, Mount Desert Island. *Science*, III. (1884), 415. — The Cantilever Bridge at Niagara Falls. *Id.*, III. (1884), 572-574.

HYATT, ALPHEUS (Prof.). Annual Report as Curator Boston Society of Natural History. *Proc. Boston Soc. Nat. Hist.*, XXII. (1882-83), 339-355. Also, Pph., 8vo, pp. 20. Boston, 1884. — Genera of Fossil Cephalopods. *Id.*, XXII. (1882-83), 253-338. — The Larval Theory of the Origin of Cellular Tissue. *Am. Naturalist*, XVIII. (1884), 460-464.

KINNICUTT, L. P. ('75). Report on the Meteoric Iron from the Altar Mounds in the Little Miami Valley, Ohio. *Seventeenth Rcp. Peabody Museum* (1884), 381-384.

NICHOLS, W. R. ('69). On the Filtration of Certain Saline Solutions through Sand. *Four. Assoc. Eng. Societies*, June, 1884.

OTIS, CHAS. P. (Prof.) Elementary German. Second edition. Henry Holt & Co., New York, 1883.

MINOT, C. S. ('72). Morphology of the Pelvis and Leg. *Science*, III. (1884), 324.

RICHARDS, R. H. ('68). Economy of Fuel in Iron Manufacture. *Science*, III. (1884), 358.

## The College World.

HARVARD.—According to the tests of a recent physical examination by Dr. Sargent, '85 has the three strongest men in Harvard College, — Foster, Boyden, and Gorham, in the order named. — Sixteen students competed for the Boylston prizes for declamation. — The Seniors won the class race, and are said to be the fastest class crew that ever rowed over the course.

YALE.—The Senior class of the Yale Law School are considerably excited over the edict of the Faculty, that a committee of the State bar would orally examine the class upon the subject of real property before they can be admitted to the Connecticut bar. The students prefer an examination by their instructor, to whose modes they are accustomed. The committee to examine are State-Attorney Hammersley of Hartford, Lyman Brewster of Danbury, and John J. Penrose of Windham. — Y. P. Lee, the Chinese student who recently returned to this country, will enter the class of '87 at Yale. He will soon have charge of one of the departments of the *Wide Awake*, published at Boston.—Prof. Whitney has been elected president of the American Oriental Society. — The college has received a gift of \$50,000 with which to erect a Y. M. C. A. building.

COLUMBIA—A new observatory is being fitted up on the top of the new Law School building of Columbia College. Heavy piers have been set in the main room of the observatory, upon which the Rutherford transit and equatorial will rest. In a short time the observatory will be furnished and in working order. Over the observatory is a large paper dome, said to be one of the best that has been made. The room of the observatory will be lighted by electric lights. — To meet the constantly increasing demand for competent librarians, Columbia College has decided to establish a "School of Library Economy," in which such instruction is to be given as shall qualify learners for the duties of professional librarians. — Columbia College students are 169 for Edmunds, 103 for Arthur, 63 for Blaine, 43 for Tilden, 30 for Bayard, and 20 for



Cleveland. — The class of '86, School of Mines, is \$126 in debt. — Columbia is to be represented at the intercollegiate bicycle races this spring. — The original endowment for Columbia was raised by lottery. — It is expected that there will be 2,000 students next year.

NOTES. — There are but three persons in the United States who have received the three degrees of Doctor of Divinity, Doctor of Laws, and Doctor of Literature. These are Prof. Wilson of Cornell, President Barnard of Columbia, and President McCosh of Princeton. — At the annual intercollegiate tennis convention, Yale, Harvard, Amherst, Wesleyan, Williams, and Trinity sent delegates. Much business was transacted, and the date of the fall tournament fixed somewhere between the 5th and 15th of next October. — According to the new constitution of the base-ball association at Princeton, the nine shall be chosen by a committee of three, consisting of the captain and two men whom he shall select as sure of positions on the nine. — There has recently been established at Racine College a new system of operations in scientific studies. It is essentially a plan to co-operate with the scientific schools of the East until the West builds a large school of the kind itself. For this purpose a new scheme of studies has been adopted by the Faculty of Racine, so arranged as to prepare men for the junior class of the best scientific institutions of the East. — The medical students at McGill University have been disgracing themselves. A professor raised the standard of his examinations and was snow-balled in the class-room till he was forced to leave. Another day they refused to show their museum tickets, and broke into one of the professors' rooms, threatening violence and shaking their fists in his face. The Faculty have taken the matter up, and a wholesale expulsion will probably result. — *University Mag.* — Eighteen professors of the University of Edinburgh receive salaries of over \$10 000 per annum.

Some of the Freshmen were greatly surprised at their laboratory term bills.



A Dirge [or, "Three Flunkers"].

Three students came forth from the college door,  
And a look of terror their features wore,  
For they just had read, on the bulletin board,  
The dates of events which they all abhorred:  
For pupils must write, though professors weep;  
And each "condition" means loss of sleep,  
With toil for neglect atoning.

Three youths sat up at the midnight hour, —  
Each conned his books with a hopeless lout,  
And thought, with a kind of sad delight,  
That he'd crammed all day and would cram all night:  
For pupils must write, though professors weep;  
And the ink will dry and the record keep  
Of neglect and of atoning.

Three missives went speeding out into the land,  
And each, with its message, came duly to hand,  
And a distant sire of hope bereft  
By the doleful news that his son was left:  
For what each has sown he must also reap, —  
So, good by to our friends in their sorrow deep  
For neglect that is past atoning.

B. C. L., '87.

#### AT THE NINETY-NINTH CENTURY CLUB.

(An association tending to the more complete fusion of fashion with intellect.)

*Miss Blowsenbury* (admiringly): Oh! Is this *the* Mr. Norridgewood?

Mr. Norridgewood, whose setter has taken a prize at the recent dog show, and who drives a dog-cart (modestly): Well, — a — ahem — a — yes. (Disgust of the real *the* Mr. Norridgewood standing near by, who has written a book on "Supposititious Generalities in their bearing on Hypothetical Relativities," and expects to address the club at the next meeting.) — *Life*.

"Hercules" is the latest name given to butter by the Andover students, among whom boarding-house milk is known as "kalsomine."



*Another Phase of Leap Year.*

*Hostess* : May n't I present you to Miss Burton, Mr. Fullalove? *Fullalove*, '87 (disconsolately) : Thank you, very, very much, but it's no use : she told me positively she would n't have me. — *Lampoon*.

If a pretty girl's mouth is an osculating circle, is kissing it a method of differential calculus?

"Yes, Bob," said one editor to the other, mournfully, "I was a remarkably pretty child when I was about five or six years old." "Is that so, old fellow, *really*, — why so was I. Let's go off on a toot together." [*Exeunt.*]

Readers of the *Mechanical News* for May 1 will recognize a familiar style in an article signed A. W. W. It is supposed to be a sly hit at our fire apparatus.

Of the Harvard Freshmen, ninety-nine per cent part their hair in the middle, thirty-eight

per cent use oil of bergamot, ten per cent go to recitations without gloves, sixty-seven per cent chew tobacco, seventeen per cent eat hasheesh. — *Princetonian*.

#### Traumerei.

Oh! for a lodge in some vast wilderness,  
Some boundless contiguity of shade,  
Where rumor of Mechanics and of Heat,  
Of unsuccessful or successful Dutch,  
Might never meet me more.

#### FORMULÆ MADE EASY.

*c* is a *constant*, reminder of duty ;  
*v* is *deflection*, from study, for beauty ;  
*i* is the *incline*, the which you run o'er,  
When *M* is the *moment* with her you adore.

At the Windsor :

"You're a liar!"

Whack!!

[No further particulars up to the time of going to press.] — *Life*.

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Washington Street.

At a recent meeting of '84 it was voted to meet once again at Young's Hotel, and a committee was appointed to draw up a constitution for a permanent class organization, to be presented at said meeting. The meeting will be held on Wednesday evening, May 21, and a large attendance is looked for. We are glad that THE TECH's suggestion was so quickly acted upon.

It is announced that an innovation is to be made this year in having the graduating exercises of '84 in the afternoon instead of in the morning, as heretofore. On account of the size of the class, it is also rumored that the graduating class is not to sit upon the stage, but is to occupy the front seats on the floor of Huntington Hall.

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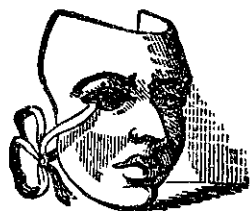
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THIS school of industrial science was opened in February, 1865. The first class graduated in 1868. The school is devoted to the teaching of science as applied to the various engineering professions: viz., civil, mechanical, and mining engineering, as well as to architecture, chemistry, and natural history, physics and electrical engineering, and metallurgy.

Besides the above distinctly professional courses, the Institute offers scientific courses of a less technical character, designed to give students a preparation for business callings. A four-years' course in biology, chemistry, and physics has been established, as preparatory to the professional study of medicine.

Modern languages are taught so far as is needed for the ready and accurate reading of scientific works and periodicals, and may be further pursued as a means of general training.

The constitutional and political history of England and the United States, political economy, and international law are taught, in a measure, to the students of all regular courses.

Applicants for admission to the Institute are examined in English grammar, geography, French, arithmetic, algebra, and geometry. A fuller statement of the requirements for admission will be found in the catalogue, which will be sent without charge on application.

A clear admission paper from any college of recognized character will be accepted as evidence of preparation, in place of an examination.

Graduates of colleges conferring degrees are presumed to have the necessary qualifications for entering the third-year class in any of the regular courses of the Institute, and will be so admitted provisionally, on the presentation of their diplomas.

The feature of instruction which has been most largely developed in the school is laboratory training, shop-work and field practice, to supplement, to illustrate, and to emphasize the instruction of the recitation and lecture room.

Surveying instruments are provided for field work in civil and topographical engineering. Extensive shops have been fitted up for the use of both hand and machine tools; and a laboratory of steam engineering has been established as a part of the instruction in mechanical engineering. Several steam boilers and steam engines of various types are available for experiments and tests. The department of mining engineering and metallurgy has the use of laboratories in which the milling and smelting of lead, copper, silver, and other ores, in economic quantities, are regularly performed by the students themselves. The classes in architecture supplement the work of the drawing and designing rooms by the examination of structures completed or in course of erection, and by practical experiment in the laboratory of applied mechanics, testing the strength of materials and working out problems in construction. The Kidder Chemical Laboratories, just completed, contain desks for four hundred and twenty-six students, and afford the best modern facilities for the study of general, analytical, and organic chemistry. The Rogers Physical Laboratory has been greatly extended in every department during the past year, especially in respect to facilities for instruction and research in electrical science.

On the successful completion of any one of the four-year courses of the Institute, a degree of bachelor of science will be conferred. The Institute is also empowered to confer the degree of doctor of science. Special students are allowed to enter special divisions of any of the courses, on giving evidence that they are prepared to pursue with advantage the studies selected.

The Institute of Technology, as a recipient of a portion of the United States grant to colleges of agriculture and the mechanic arts, gives instruction in military tactics.

The fee for tuition of students taking the full course is \$200 a year. Besides this, \$25 or \$30 are needed for books and instruments. There are no separate laboratory fees. Only payment for articles broken is required.

Attached to the Institute are also two special schools: viz., the "School of Mechanic Arts," and the "Lowell School of Industrial Design." The former gives a training in the use of tools, together with elementary mathematics and drawing. English, French, and geography are also taught in this school. The fees for tuition are \$150 a year. The Lowell School teaches the making of designs for prints, carpets, wall-papers, laces, gingham, and other woven goods. A weaving department with a variety of looms is connected with this school. No charge for instruction is made.

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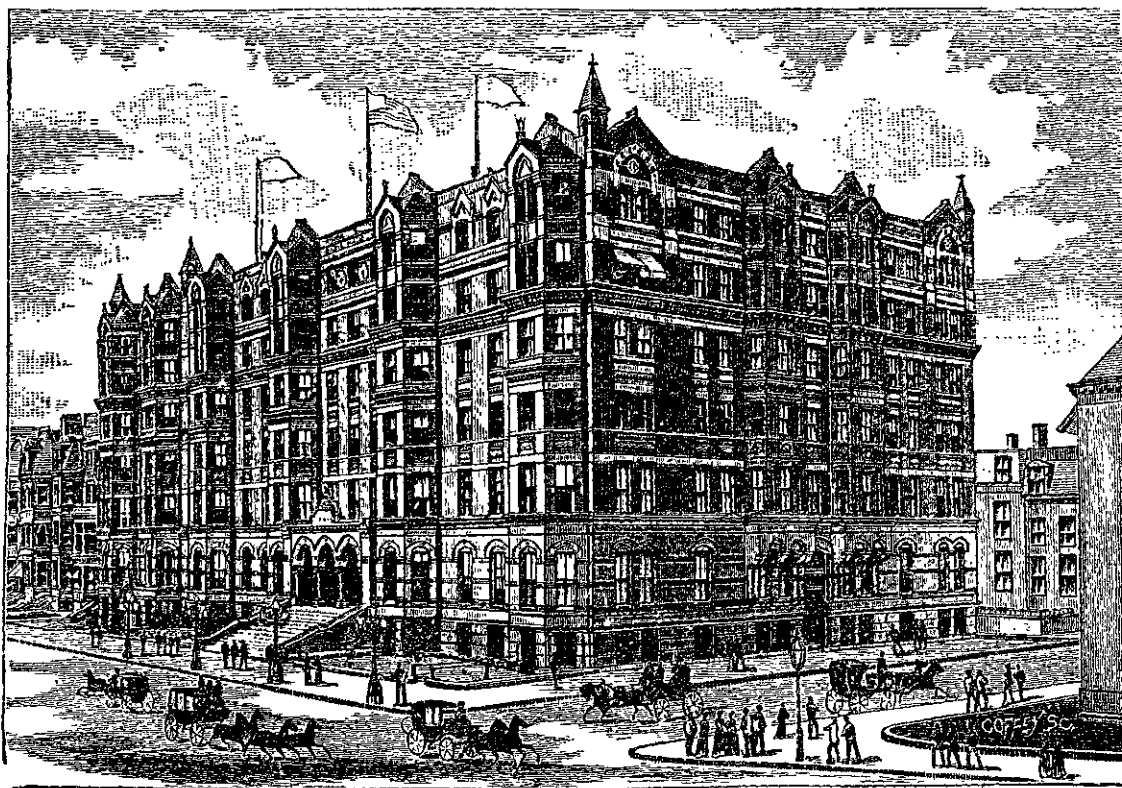
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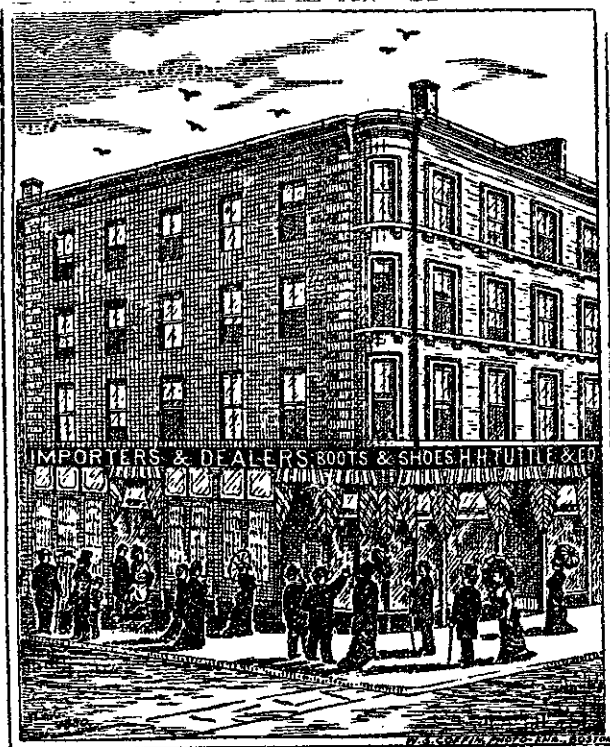
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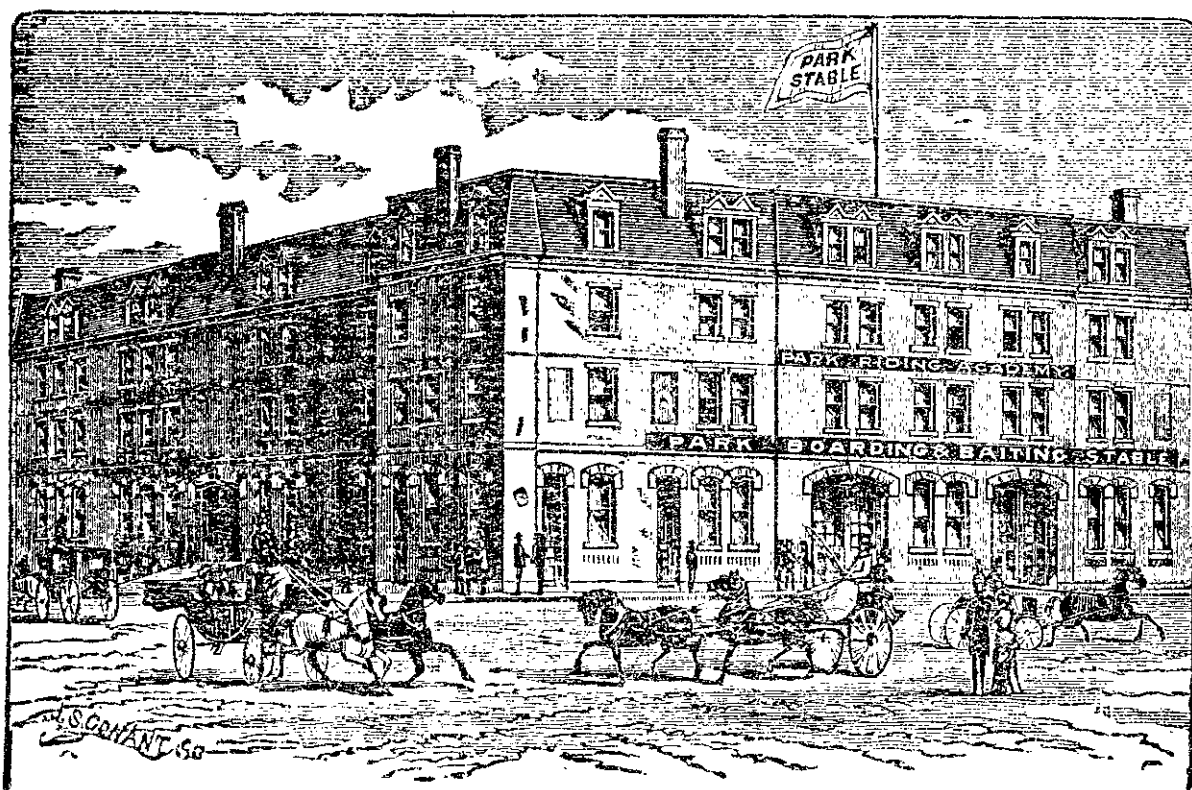
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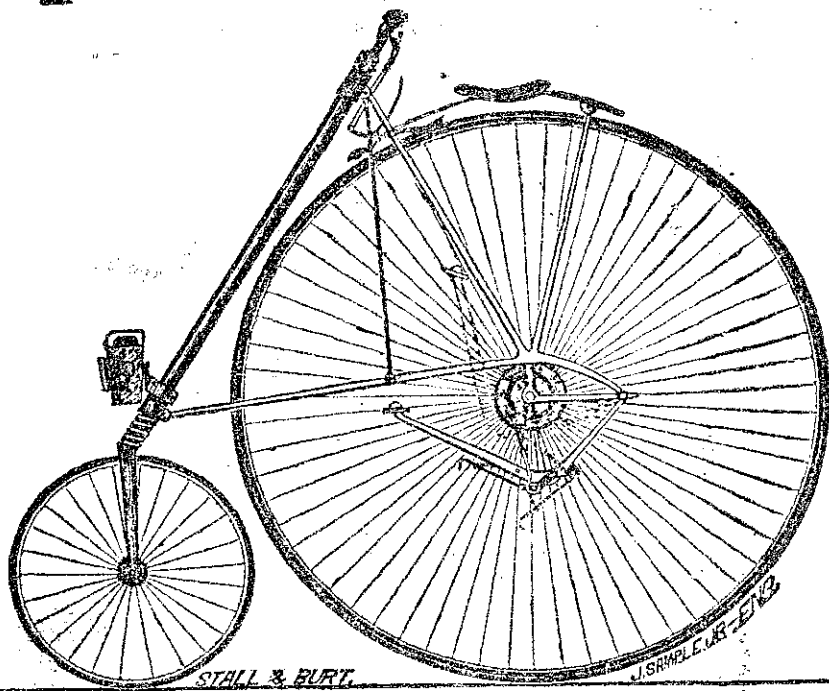
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